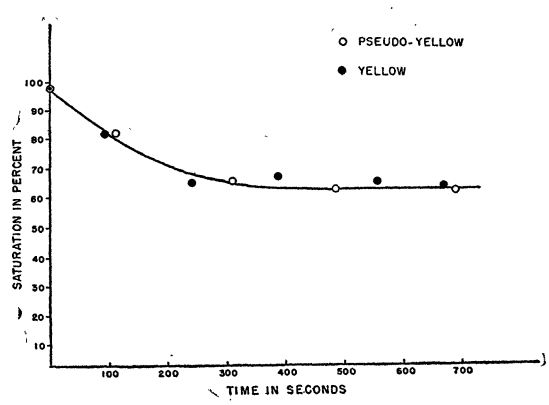

FIG. 2

adjusting the primaries (radiations at 436 mμ, 546 mμ, and 700 mμ) of the right test patch. The observer was the author.

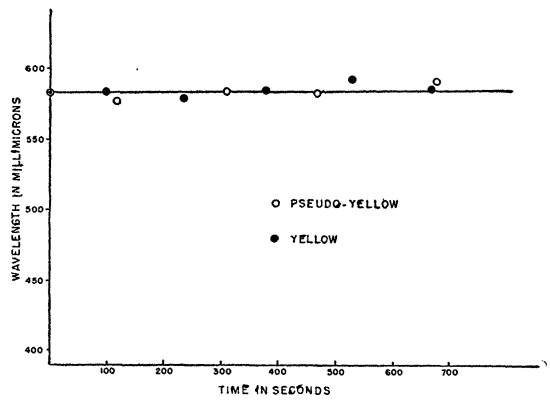

FIG. 3

Figs. 2, 3, and 4 give the resulting curves for both the yellow and pseudo-yellow filters. Fig. 2 indicates the loss of saturation for both stimuli; Fig. 3, the constancy

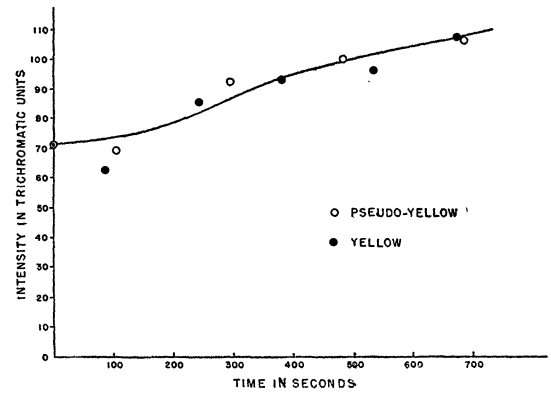

FIG. 4

of hue for both stimuli; and Fig. 4, the gain in intensity for both stimuli.[2]

[2] These results are not to be compared with our previous curves (*1*, pp. 103–105), since no attempt was made to equate these stimuli with those used before.

The divergence of the yellow and pseudo-yellow curves appears to be well within the experimental error, and we conclude that, as far as our experimental work has gone, the color adaptation phenomenon is a function of the tristimulus values of the stimulus and not of the spectral composition of the stimulus. There is, of course, an internal check. If the filters are placed one on either side of the colorimeter so that the observer may fixate the yellow and pseudo-yellow stimuli simultaneously, then, although the colors appear to change with time, they should always look alike. This has been done, and, indeed, the colors always do look alike.

The eye has always failed to resolve a stimulus into its components and it has here failed again. But we wonder about a mechanism which is so complex that it always fulfills this ideal, even under the most elaborate experimental conditions. It constitutes the great enigma of color vision.

References

1. COHEN, J. *Amer. J. Psychol.*, 1946, **59**, 84.
2. COHEN, J. *Psychol. Bull.*, 1946, **43**, 121.

Chloromycetin in the Treatment of Scrub Typhus[1]

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The antibiotic Chloromycetin (*1*) has been shown to have a beneficial chemotherapeutic effect when administered to mice or embryonated eggs infected with a number of rickettsial agents (*3*) or with two viruses of the psittacosis-lymphogranuloma venereum group (*4*). The drug is rapidly absorbed when given by mouth to human beings and readily reaches concentrations in the blood of the order of 40 γ/cc (*2*). No obvious toxic effects attributable to the drug have been observed in the normal men or the patients who have been studied to date. A report of the encouraging results observed in a few cases of epidemic typhus who were treated with Chloromycetin early this year in Mexico has been submitted (*5*).

Methods commonly employed in the ward and clinical laboratory were used in most of the work. Mice were inoculated intraperitoneally with defibrinated blood cells from the patient in attempts to demonstrate rickettsemia. Results were considered positive when mice of the original

[1] Read before the Section on Virus and Rickettsial Diseases, Fourth International Congress on Tropical Medicine and Malaria, May 11, 1948.

or one of the subsequent passage groups showed typical lesions of scrub typhus and provided material in which rickettsiae were demonstrated microscopically. Chloromycetin was supplied by Parke, Davis and Company.

Twenty-five persons with scrub typhus were treated with Chloromycetin. Each of these presented the usual clinical features of the disease. Furthermore, the diagnosis was proved in each instance by recovering *Rickettsia tsutsugamushi* from the blood taken prior to treatment or by demonstrating the development during convalescence of agglutinins for the OX-K strain of *B. proteus*. Rickettsemia occurred in 20 of the 25 patients in the treated group, and a positive Weil-Felix reaction in 24 of this group. All 12 of the control cases gave positive Weil-Felix reactions.

Statistical data on the treated and untreated groups of patients are summarized in Fig. 1. None of the treated group developed complications attributable to the disease or to the drug, and none died. One patient who received Chloromycetin on the 3rd day was discharged from the hospital for light work on the 9th day after onset. The first patient in the group was held for observation in the hospital for 28 days.

Twenty-two of the 25 treated cases derived their infections from exposures in areas within a radius of 20 miles of Kuala Lumpur. Eleven of the 12 untreated cases of scrub typhus who were observed during the period also contracted their disease within this general area. Indeed, 5 of the 12 controls became infected while working in precisely the same spots which provided 14 patients of the

SCRUB TYPHUS PATIENTS

KUALA LUMPUR, 1948

	TREATED	UNTREATED
Nº OF PATIENTS	25 18 MALES 7 FEMALES	12 ALL MALES
DAY AFTER ONSET Rx BEGUN	3 TO 11 AV. 6.2	
LAST FEBRILE DAY OF ILLNESS	4 TO 12 AV. 7.5	13 TO 29 AV. 18.1
DURATION OF FEVER (HRS) AFTER Rx BEGUN	10 TO 96 AV. 31.0	
DAY AFTER ONSET DISCH'D FROM HOSP.	9 TO 28 AV. 19.2	17 TO 53 AV. 30.7
COMPLICATIONS	0	1 PAROTITIS 1 PNEUMONIA
DEATHS	0	1 17TH DAY
MONTH OF ONSET	MAR – APR	FEB – MAR

FIG. 1

treated group. Hence, one may assume that the strains of rickettsiae which infected the treated and control groups were fairly comparable in virulence. The test and control groups may also be assumed to be comparable with regard to capacity of the individuals to overcome infection with *R. tsutsugamushi*. Thus, the age distribution and the distribution of Europeans, Malays, Indians, and Chinese among the controls were similar to that of the treated group. The sharp contrast in the clinical responses of the two groups is clearly evident from the data summarized in Fig. 1.

The typical response of a patient with scrub typhus following treatment with Chloromycetin is illustrated by Case 4, whose findings are graphically presented in Fig. 2.

All 25 patients in the treated group received an initial oral dose of approximately 50 mg of Chloromycetin/kg

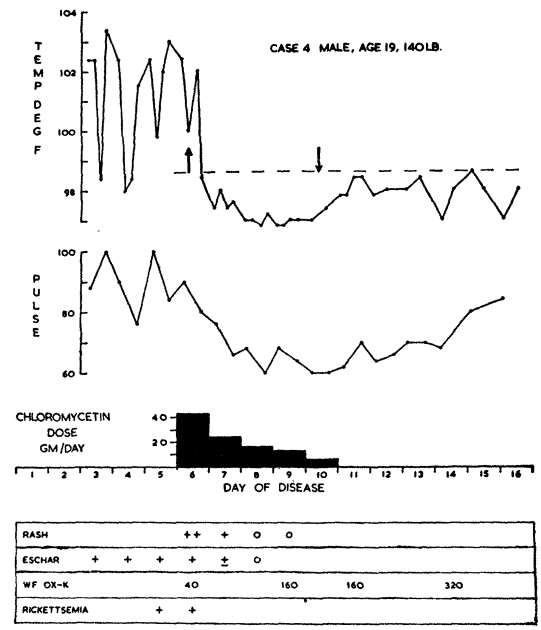

FIG. 2

of body weight and were subsequently given 0.2–0.3 gm of drug by mouth every 2–4 hrs for a variable time. During the initial part of the work, treatment was continued until at least the 12th day after onset; these patients received totals of 8–15.5 gm of drug. The duration of treatment was gradually shortened, and the last 7 cases were given the drug for only 24 hrs; these received a total of about 6 gm during this period. Their responses with this short regime were as satisfactory as with the longer periods of therapy.

Determinations of the amounts of drug present in the bloods of the treated patients have not yet been made. It is of interest that Chloromycetin can be employed successfully without dependence upon the results of such assay techniques. The practicality of the use of Chloromycetin is further emphasized by the fact that 12 of the 25 patients were treated in estate hospitals, where conditions are no more favorable for complete nursing care than in the average private home in the United States.

References

1. EHRLICH, J., BARTZ, Q. R., SMITH, R. M., JOSLYN, D. A., and BURKHOLDER, P. R. *Science*, 1947, **106**, 417.
2. LEY, H. L., JR., SMADEL, J. E., and CROCKER, T. T. *Proc. Soc. exp. Biol. Med.*, 1948, **68**, 9.
3. SMADEL, J. E., and JACKSON, E. B. *Science*, 1947, **106**, 418.
4. SMADEL, J. E., and JACKSON, E. B. *Proc. Soc. exp. Biol. Med.*, 1948, **67**, 478.
5. SMADEL, J. E., LEON, A. P., LEY, H. L., JR., and VARELA, G. *Proc. Soc. exp. Biol. Med.*, 1948, **68**, 12.